

Future Path for the TELESYNERGY® Environment

K.M. Kempner*, F.S. Govern#, R.L.Martino*

* Center for Information Technology
National Cancer Institute
National Institutes of Health
Bethesda, MD 20892 USA

Evolution of TELESYNERGY®

- Evolving Project Goals
- Evolving Network Infrastructure
- Evolving Computing Platforms

Evolving Project Goals 1 & 2

- Implement prototype Asynchronous Transfer Mode (ATM) Network and ATM-compatible multimedia Workstations, as research project to explore and exploit benefits of ATM in medical consultation environment
- Develop unique high-performance telemedicine platform for use in multi-site clinical settings, spanning variety of medical specialties, as specific area of application

Evolving Project Goals 3 & 4

- Choose tasks for initial implementation based on image communication and consultation requirements of NCI Radiation Oncology Branch (ROB) Intramural Program
- Deploy Research Version of TELESYNERGY® Systems in support of NCI ROB Activities

Evolving Project Goals 5 & 6

- Deploy Semi-Production Version of TELESYNERGY® Systems in support of NCI Radiation Oncology Sciences Program (ROSP) Capital Consortium
- Deploy Semi-Production Version of TELESYNERGY® Systems in support of NCI ROSP Worldwide Virtual Integration Initiatives

Evolving Project Goals 7 & 8

- Develop Production Version
TELESYNERGY®V.2 System (all commercial components) to facilitate deployment to
Second Phase Virtual Integration Initiatives
- Deploy Production Version
TELESYNERGY®V.2 Systems to support NCI
Cancer Disparities Research Partnerships

Virtual Integration

The combination of legally independent organizations, located over wide geographic area, which are committed to achieving collective goal by pooling their core competencies and resources

NCI Virtual Integration Initiatives 1

- NCI ROSP Capital Consortium

 - Walter Reed Army Medical Center

 - (Washington, DC)

 - National Naval Medical Center

 - (Bethesda, MD)

- NCI Partnerships in Science Program™

 - Holy Cross Hospital (Ft. Lauderdale, FL)

 - Wheeling Hospital (Wheeling, WV)

NCI Virtual Integration Initiatives 2

- NCI All Ireland Cancer Consortium
St. Luke's Hospital (Dublin, ROI)
Belfast City Hospital (Belfast, NI, UK)
- NCI Jordan Cancer Collaboration
King Hussein Cancer Center
(Amman, Jordan)

NCI Virtual Integration Initiatives 3

- NCI Cancer Disparities Research Partnerships

Evolving Network Infrastructure 1

- Private ATM OC-3 Network on NIH Campus provides high-speed pathway connecting on-campus Research Version TELESYNERGY® Systems
- Integrated Services Digital Network (ISDN) Primary Rate Interface (PRI) Gateway allows connection from ATM Cloud to off-campus, Semi-Production Version TELESYNERGY® Systems

Evolving Network Infrastructure 2

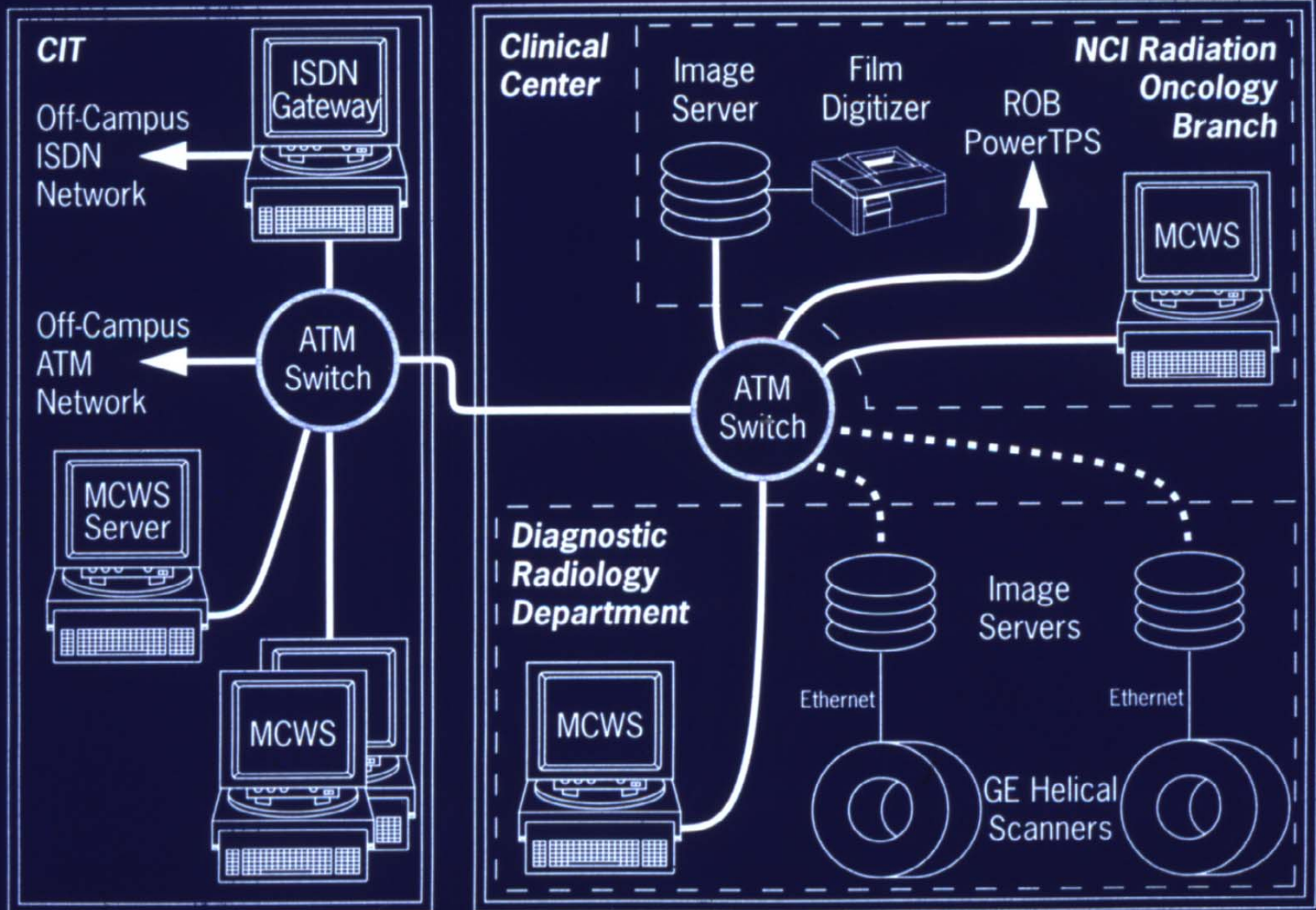
■ ATM OC-3 Network

- 155 Mbits/sec: Audio, Video and Data
- Audio/Video signal routing utilizes special point-to-multipoint mode negotiated by Conference Server
- Multi-site Synchronization via Message Passing Interface enforced by Conference Server

■ ISDN PRI Circuit Extensions

- 768 Kbits/sec (12 B Channels): Audio/Video
- 512 Kbits/sec (8 B Channels): Data (Ethernet)
- Gateways provide ISDN PRI link to ATM Network

PROTOTYPE TELESYNERGY™ CONSULTATION NETWORK



Evolving Network Infrastructure 3

- ISDN PRI Multipoint Control Unit (MCU) and Ethernet Router Cluster will replace ATM Architecture for Production Version TELESYNERGY®V.2 System
- Software Interface for Research and Semi-Production Version TELESYNERGY® Systems will allow interoperability with Production Version TELESYNERGY®V.2 System

Evolving Network Infrastructure 4

- Conference Capacity for TELESYNERGY®
 - Via Fiber Connection to ATM Cloud – 4
 - Via ISDN Gateway to ATM Cloud – 4
- Conference Capacity for TELESYNERGY®V.2
 - Via ISDN to MCU/Router Cluster – n X 8

Evolving Computing Platforms

- Unix-based Sun Workstation platform with NIH-developed System Control and Image Handling Software in Research and Semi-Production Version TELESYNERGY® Systems
- Windows-based PC platform with Commercial Image Handling Software in Production Version TELESYNERGY®V.2 System

TELESYNERGY®V.2

Production System 1

- Windows-based PCs utilized for System Control/Image Handling and Sheet-Film Digitizer/Microscope Camera Control
- Digital Flat Panel LCD Electronic View Box (EVB) replaces Analog CRT EVB
- 42-Inch Flat Panel Video Monitor replaces LCD Projector
- Manual Control of Microscope

TELESYNERGY®V.2 Production System 2

- Commercial Image Viewer Software replaces NIH Custom Software, with initial functionality subset/superset of Research and Semi-Production Version TELESYNERGY® Systems
- Central ISDN PRI Multipoint Control Unit (MCU) and Ethernet Router Cluster controls audio/video and data routing for Production Version TELESYNERGY®V.2 System